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AUTHOR Lyons, Raymond F.
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ABSTRACT

Because projections of manpower requirements can be an important factor in educational planning, it is important that the planner understand how they are undertaken and be able to participate in them, particularly in discussing matters of direct relevance to education. This lecture provides an introduction to the principles and the problems involved in manpower projections for educational planning. It considers (1) analysis of the existing situation of education and employment in order to prepare the basis for an educational plan that takes account of employment requirements and possibilities; (2) the main practices and principles involved in preparing a perspective plan for education in the light of manpower needs; and (3) some objections to the manpower approach to educational planning. (Author/IRT)

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# The Fundamentals of Educational Planning : Lecture - Discussion Series

No. 20 PLANNING EDUCATION FROM THE STANDPOINT OF MANPOWER NEEDS

by Raymond F. Lyons

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7, rue Eugène Delacroix
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# PLANNING EDUCATION FROM THE STANDPOINT OF MANPOWER NEEDS

by

Raymond F. Lyons

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IT IS SUGGESTED THAT STUDENTS READ THE TEXT CAREFULLY BEFORE LISTENING TO THE TAPE.

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## INTRODUCTION

The educational planner will not himself be required to undertake projections of manpower requirements. But as these can be an important factor in educational planning it is important that he should understand how they are undertaken and be able, as a staff officer in the Ministry of Education, to participate in them, particularly in discussing matters of direct relevance to education.

This lecture is intended to provide an introduction to the principles and the problems involved in manpower projections for educational planning. We shall therefore consider:

(a) the analysis of the existing situation of education and employment in order to prepare the basis for an educational plan which takes account of employment requirements and possibilities;

(b) the main practices and principles involved in preparing a perspective plan for education in the light of manpower needs;

(c) some objections to the manpower approach to educational planning.

## A. THE ANALYSIS OF THE EXISTING SITUATION OF EDUCATION AND EMPLOYMENT

It is important to appraise the relationship between employment and education for two major reasons. First financial resources are limited and it is desirable that the educational effort, in response to the aspirations of the community for enlightenment, should be reconciled as closely as possible with the possibilities of filling the types of employment which are desirable for economic growth. Second, teachers constitute a high proportion of high and medium level manpower; demand for education implies a demand for manpower in competition with other sectors of the economy. It is therefore necessary that the existing situation of education itself as well as its future development should be scrutinized from the standpoint of its needs as a large consumer of its own 'products'.

### FORMAL AND NON-FORMAL EDUCATION

What levels of education and qualification should be examined? Obviously a major point underlying the analysis is that the performance and fitness of the educational system as a 'producer' of different levels and types of manpower should be appropriate to each country's development needs. But this is not always the case. One can conceive of an educational system which in its structure, curricula and methods is inappropriate, and procedures, based on manpower considerations, which resulted in its mere expansion, unaccompanied by radical improvement, would result in waste of resources.

It is also necessary to consider the relationship between formal education and non-formal education in satisfying specific manpower needs. How much general education and how much training and learning on the job should be associated with each level and type of employment? It is perhaps dangerous to accept qualifications criteria in a rigid fashion. In a rapidly developing country everyone should be learning on the job since there may not be time or money to learn otherwise. Consequently the planning of non-formal education (which yields results more quickly) should be of great interest.

University education is not always essential in filling the high level manpower posts. In some countries, such as the United States, only about half of the practising engineers have degrees. The others have acquired their qualifications mainly by post-secondary part-time study and practical experience. Moreover, many firms in developed countries lay much greater weight on the training which they themselves give their employees than on the formal post-secondary education which their trainees possess.

On the other hand, doctors everywhere need a degree. A dentist may or may not. In some countries dental study is still partly technical; in others it is fully university in character. In some countries a degree is essential for secondary school teaching; in others not. Normally only a graduate can teach in a university. Some universities demand only a first degree, others may require a doctorate and substantial post-graduate work. In some countries managers require a degree; in others, not. The combination of formal university instruction and on-the-job training is essential in the case of medicine or surgery, less so in the case of a profession like engineering, and largely a social convention (but with major cost implications) when it comes to staffing national administrations. In general the need for university training for professions must be judged country by country. At the medium-level of manpower, there may be adequate provision for in-service training by firms and administrations or, for a variety of reasons, there may be dependance on formal education. In developing countries governments are often obliged to undertake expensive post-secondary technical education since enterprises are reluctant to do so. Frequently parents are opposed to technical work for reasons of prestige as well as salaries. Consequently the planning of technical education requires a complex of measures involving employers, parents, students and national authorities.

At the primary level inadequate harmonization of primary education with rural development often represents the greatest defect as far as the linkage between formal education, non-formal education and employment are concerned. The primary system has been designed to produce office workers rather than provide the basic education for efficient farmers. This represents a major weakness in national educational policy and can have serious social results

in terms of youth unemployment. In too many countries primary education in rural areas, which includes the bulk of the primary school population, is not linked in a complex of specific programmes of non-formal education in country or town (community development and agricultural assistance, part-time technical education). It is this that ensures integration of better educated pupils into the rural framework. In the town framework when, as is natural, many young people leave for the towns, it is necessary to strengthen arrangements for apprenticeship and non-formal education.

## B. PREPARING THE PERSPECTIVE PLAN IN THE LIGHT OF MANPOWER NEEDS

Let us now turn to the stages involved in working out future manpower requirements and on which an educational plan should be partly based. They are as follows:

### INVENTORY OF EDUCATION

First, the inventory of education for the base year - the one taken as the basis for a plan. The inventory includes the number of students who have enrolled; of teachers and their qualifications (How many teachers are there? Where are they? What are their qualifications?); of enrolments and graduations in teacher training establishments and finally, the number and nature of school buildings and equipment. It also includes a survey of the output of the system, in terms of graduates and existing trends and plans.

### INVENTORY OF MANPOWER

The second stage is the inventory of manpower for the base year, i.e. the study of the country's existing labour force. We need to know the number of people of working age. Working age varies from country to country although normally it is from 15 to 64. But in a country where there are say 5 years of primary education, beginning at 7 and finishing at 12, it is obvious that many children will begin work at less than 15.

There will also be children who drop out from the educational system and who seek employment below the minimum leaving age of primary education, even if it is compulsory. In a developing country it is doubtful whether the bulk of those children will seek paid employment. It is much more likely that they will be part of the village and will undertake unpaid employment for their parents and relatives within the village. When we talk about the labour force we often neglect the problem of these young people aged 12 onwards who seek work on leaving school.

Then we have to consider underemployment. What proportion of the labour force is actually employed? In developing countries we can distinguish between paid and subsistence workers. In manpower surveys we confine ourselves to wage and salary employment and we note that frequently there is underemployment in rural areas i.e. a situation in which the employed population only receives wages for part of the year.

We need to know the occupational distribution of employed workers by industrial branch. It is also necessary to classify the labour force by sex and level of education. Not all educated women can or should work. The reason is, as all the available research shows, that a major factor in the efficiency of study in education, and indeed in the efficiency of preparation for work, is the home environment. Here the mother is the chief determinant so part of the educational qualification of the total population will be in the home. Educational planning must therefore try to provide substantial education for women who will leave work, between the ages of 16 and 25 and many of whom will return to work after the age of 35. This is important in working out educational targets and needs to be specifically mentioned because the manpower analysis on its own will not show this factor, although an analysis of the educational qualifications of total population will do so.

THE NATIONAL CENSUS

This information about manpower is obtained firstly through the national census, which is normally decennial, and sample surveys by national statistical offices between the ten-year censuses. The census should include questions about work as related to educational qualification, sex and age. If the census is properly drawn up and answered a major element required by the planner in forming an inventory of manpower for the base year will be available. So in developed as well as developing countries, the census is of great importance.

A census is a major undertaking. In some countries it can be answered without difficulty by the citizens. In others it requires a considerable organizational effort by the central authorities. The essential facts which a census should tell you are the breakdown of the population by occupation, by educational attainment and by age. Comparing information from one census with the next one ten years later gives a clearer picture of the link between education and occupation. In many countries there was not a detailed census of this type ten years ago, but one has been undertaken since. Assuming that the next one, and the one after that, will be of the same type or improved, they should enable the authorities to observe this school-job linkage.

SAMPLE SURVEY

Another method is the sample survey of population where skilled staff select an area, and ask census-type questions relating to occupation and educational attainment, including age and sex. But sample surveys, if valuable, are expensive - though less expensive than censuses.

ESTABLISHMENT SURVEYS

Then there are establishment surveys which are also important ways of obtaining information about manpower and manpower requirements. In many countries the civil service is well placed to undertake an establishment survey and does so. In countries which were under British influence one of the duties of the civil service commission was to survey the numbers and efficiency of the civil service, and to test the personnel from time to time to see if they should be maintained, downgraded or possibly dismissed. The role of the civil service commission therefore is to assess the numbers and performance of the civil service in relation to needs and this is an important means through which government requirements are made known to the manpower planners.

SURVEYS IN INDUSTRY

In undertaking a survey of manpower in industry, businesses are asked to indicate the qualification and employment structure of their firms and to state their short, and possibly longer-term needs. It is however difficult for individual employers, or even nationalized industries, to assess their long-term needs. Employers' views of short-term needs are often dependent on the market situation. When business is booming employers say they need a large number of employees because they assume that demand is going to increase and that if they do not get the available manpower their competitors will. If business is depressed the opposite considerations obtain. Consequently individual employers' shorter-term forecasts tend to be either over-optimistic or over-pessimistic and it is the duty of the manpower authorities to moderate these views.

FUTURE NEEDS

The perspective for employment will be conditioned by the rate of growth of the economy, its distribution by sector and also by the salary structure. Manpower surveys generally contain no explicit assumptions with regard to the structure of salaries. This is because it is not possible to forecast what the result of national economic policy or of special measures to encourage employment will be. Manpower surveys postulate that a certain growth of output and of services will be associated with employment requirements defined

in a fairly broad way. This does not mean that the problem of the general level of salaries or of the mutual relationship of salaries is ignored. Quite the reverse, since in some countries this problem may be a major impediment to the growth of employment. Rather it is assumed that, to assure economic growth, governments as part of their overall economic and social planning must take the necessary steps in general economic policy, including salaries and taxation, and in information, to ensure that the labour market functions effectively and that unemployment does not occur.

It should also be borne in mind that only a part of high and medium level employment requirements, is directly associated with the growth of production. Requirements linked with social policy, which it is not easy to articulate over the long term, may account in developing countries for more than half the total needs. These requirements are a function of government policy but also of the rate of growth of the gross domestic product, of the part of it which governments can spend, and in some countries of the rate of increase of external assistance. Consequently projections of employment in the social services sector must always be based on the assumption that government policies will follow a certain path over the longer term. This is why it is important that a general economic and social plan should be the framework within which the manpower and educational plans are incorporated.

MANPOWER NEEDS OF THE PUBLIC SERVICES SECTOR

Estimates of manpower needs are required for all types of employment not only those directly associated with production. Thus besides industry and mining and agriculture it is necessary to consider requirements of public and private services. The manpower needs of general administration will to some extent depend on the expansion of public services as a whole. It is nevertheless not too difficult for the responsible officials in the civil service to project the employment requirements of major units by level and type of personnel. The danger lies in undue proliferation and excessive grading in terms of educational qualification of posts.

Total requirements of personnel for military services, police and judiciary, health, public works etc. will depend on the choice of priorities made within the national plan and the projected size and structure of those services.

Perhaps the most difficult task concerns the estimation of personnel required for education. Working out the desirable number and qualifications of teachers is especially crucial. Meeting the demand for teachers may imperil the satisfaction of other national needs or require the massive import of foreign teachers. Thus the size of the educational effort and the

qualifications of the teachers has to be fitted into other national priorities, the contribution education makes to meeting manpower needs being weighed against its claim on manpower resources. This means difficult choices particularly in relation to teacher qualification and numbers of teachers in primary education.

RURAL DEVELOPMENT

Turning to the public effort to assist rural development, a problem in most developing countries is whether the authorities look sufficiently hard at the need for high and medium-level personnel to aid a co-ordinated attack on the problems of the rural sector where the majority of productive workers are occupied. My impression is that this is a blind spot of development.

I was asked recently to comment on a paper that had been prepared by an international organization in Latin America on needs for high-level personnel for research in agriculture and forestry. The data which has been collected showed two things. First, qualified personnel were overwhelmingly concentrated in the cities and there were few people in the field. Second, there were few technicians. Practically everybody was a 'general', in terms of educational qualification. This is the danger; a lot of high-level people and not sufficient medium-level people to undertake effective work in the field.

In manpower surveys, the personnel needed for adequate rural development is often not indicated. One reason is that surveys tend to concentrate on market activities - estate production. Where there is no administrative structure to link the total complex of rural development activities it is difficult to indicate clearly what total manpower requirements amount to.

A related point concerns high and medium-level manpower requirements where half the rural population is pastoral. This is the case, for example, in Kenya, Tanzania and Pakistan. Prices of typical commodities which developing countries export, such as cotton, sisal, cocoa, ground nuts, have not risen much over the last few years. But countries which have been able to export high-quality meat and dairy produce have done well. This shows how exports are partly dependent on producing sufficient technicians to help develop pastoral activities.

THE COMMERCIAL SERVICES SECTOR

It is important that adequate provision be made for the manpower needs of tourism, banking, transport and trade. Experience in Mediterranean countries have indicated that employment in these sectors has increased

considerably in recent years. Spain's net tourist receipts for example are now about equal to its entire imports of heavy industrial equipment. It is clear that due attention to personnel requirements is vital.

FORECASTING SIZE OF LABOUR FORCE

A major element in the approach employed by those responsible for manpower forecasting is to project the size of the total labour force for the target year, and for intervening periods of five-year intervals. The keys to forecasting the size of the total labour force are population and the number of people of working age. If a country has a population which, because the death rate has dropped and the birth rate has increased, is doubling every twenty years, a major problem is to find jobs for those people and to use that human wealth to increase the welfare of the nation. It is a fact that because of medical advances population is rising rapidly in most countries. So you have a rising population and, partly because of increased educational provision, a rising proportion of the population seeking employment. Part of that employment will be wage and salary employment in the monetary sector of the economy, and part will be subsistence employment.

The sex distribution of the labour force is extremely important, as a substantial proportion of female workers will leave employment for part of their working life in order to raise a family. Part of the educated female population will not seek employment but will be involved in household duties.

How does one forecast the proportion of the population that will seek employment? At the lower limits you have education, and at the upper limits you have retirement. So if children begin work later and if workers retire earlier the participation rate of the population in the labour force in the intermediate years must be higher. What is the retirement age? What is the age at which work begins? What are the hours of work? We need that kind of information. It is also necessary to look at the trend of total hours of work (which influence total participation in the labour force) because this tends to be down-wards as a result of trade union activity, growing intensity of work and so on.

THE RATE OF ECONOMIC GROWTH

The next stage in the work of making long-term projections of manpower requirements is estimating total employment in each sector and branch of the economy for the forecast years. This is a problem which goes to the root of manpower forecasting because total employment in each sector and branch, for the forecast years, is determined by the rate of growth of the gross domestic product. The faster the rate of growth of the economy the larger the rate

of growth of employment, subject of course to the moderating influence of the rate of growth of productivity, i.e. of output per person. There is a lot of professional discussion among economists about the difficulties of forecasting the rate of growth and the distribution of growth over the long term. It is also hard to say what the rate of change of technique is going to be so that we cannot forecast the distribution of national activities by branch and industry with precision.

We must also distinguish between forecasts of economic growth that are made in response to political influences and which are too high, and rates of growth which are reasonable. In most countries the rate of growth of gross domestic product which has been realized this decade is 4 to 5 per cent, whereas certain countries have included in their manpower and economic plans rates of growth of 7, even 8, per cent. This is important because if the growth rate is put too high, skilled manpower requirements are put too high and therefore the requirements of education, especially higher and intermediate education, are exaggerated and unemployment results when plans based on these estimated requirements are fulfilled. If the forecast growth rate is moderate then the demand for personnel and for education will be moderate, unless there are already considerable shortages.

GROSS NATIONAL PRODUCT BY SECTOR

A further problem is to break down the gross national product in the target year by main sectors. Having obtained the total size of the gross national product in the target year on the basis of assumptions regarding the annual rate of growth, the economic development plan breaks down the gross national product, by main sectors; industry, agriculture, services and government. The growth of government and of government expenditure on education and health is a function of the growth of total production. In a developing country it is easier to forecast output by sectors than in advanced countries because over the next 10 to 15 years developing countries will, to a large extent, be adapting the techniques - whether in agriculture, industry or services - used in advanced countries.

Even so it is generally extremely difficult to work out the distribution of employment by sector. For example, in the Soviet Union where success has been achieved in many respects, the growth of production by individual sectors has not always been in line with forecasts made by economists. In a mixed economy such as that of France the automobile industry has developed much faster than the planners would have wished, but as the automobile industry is largely outside the direct control of the authorities there was little that they could do about it. The priorities which were originally planned had to be altered; the large number of cars on the roads made it necessary

to give roadbuilding greater priority. But the main question is whether, overall, the decisions taken in education and in other matters will be wiser than otherwise because of this perspective look at development. The answer is positive.

ESTIMATING PRODUCTIVITY

After the gross national product has been projected in the perspective plan, and broken down by main sectors, the economic department estimates the evolution of employment by sector and branch. Here the problem is to work out the growth of productivity in each sector of the economy. In the steel, oil, transport or building industry, estimating productivity is relatively simple in that it can be measured in terms of output per man, but how do you work out productivity in the government sector? How do you assess the productivity of education? The answer is that those responsible for these estimates in the economic department do not do so. In such calculations of productivity the government sector is looked upon as a residual.

If you are trying to work out productivity - the amount produced per worker - you have to assume first, the amount of equipment that the worker will have available and secondly, the capacity of the worker to use that equipment. But it is no use having better equipment unless workers are able to use it more effectively. It has been the experience in some developing countries, particularly where development has been a rapid process, that in certain sectors equipment has not been used as effectively as it might have been and consequently productivity has not increased as rapidly as expected.

Statistically the growth of employment must be a function of the growth of total output and the growth of productivity. In other words, the more efficiently each person works, the less people will be required to produce a defined amount. Let us assume that output in a given industry is to go up by 100 per cent. On the other hand the efficiency of each worker will go up by 50 per cent as a result of better equipment and training. Therefore what happens to total employment? Does it go up by 100 per cent or 50 per cent? It goes up by 50 per cent.

Secondly, assume output goes up by 100 per cent, but that productivity does not go up at all because the workers say: 'After we have worked with these new machines for 40 hours instead of after 50 hours as we used to we have done enough.' Productivity does not go up at all, so what happens to total employment? It goes up by 100 per cent if the firms do not become bankrupt.

In real life the converse is more likely: output goes up by 100 per cent, productivity goes up by 100 per cent. What happens to employment? There is no increase in employment. This is what has been happening in many new industries. For example, in a recent study of the employment effects of Mexico's national plan it was found that employment had risen much less rapidly in the new industries than had been forecast. Why? Because first-class capital equipment had been invested; it produced more and so the number of workers rose very little.

However, though the total growth of employment in these new industries may be much slower than expected, the occupational composition of that employment normally reflects a greater concentration on skilled workers, technicians and high-level personnel.

The efficiency of production is determined by the equipment the people have to work with and by their intelligence and skill in using that equipment. In a country with a low rate of investment one would expect a low rate of increase in productivity. However, there will be certain sectors of the economy where the most up-to-date methods are employed. For example, the steel industry of Gabon or the petroleum industry in Iran are extremely capital-intensive industries where a high proportion of total output is accounted for by the growth of productivity and the rate of increase of employment is slow.

So the forecast of total employment is broken down in each sector in relation to expected growth of output and in relation to growth of productivity. And there is a reciprocal relationship between productivity and employment: the higher the growth of productivity the lower the growth of employment.

REPLACING EXPATRIATES

There are countries where there is already unemployment among trained men and women and where care should be taken with regard to additional expansion since these persons will have to be absorbed in the labour market. On the other hand, in certain African countries there is a margin for manoeuvre because there are large numbers of expatriates employed in the administration, in the economy and in education. What assumptions are made about replacing expatriates by nationals? If all expatriates are to be replaced within a determined period then expenditure on education has to be much greater than would be indicated by the mere growth of the economy and the growth of governmental services within the economy.

If the aim is to replace expatriates, to what extent does that involve political problems affecting relations with foreign countries which would influence decisions of foreign companies to invest in the country? I mention

this problem to show that the relationship between growth and manpower is complex. It depends on the initial situation, on the balance between nationals and expatriates, on the balance between supply of and demand for jobs in the base period, on existing targets within the educational system and on the projected needs by sector and main branch of employment based on the estimated rate, and total of, economic growth to the target year.

ILO's CLASSIFICATION OF OCCUPATIONS

Manpower surveys usually divide employment into four major classifications, taking the international standard classification of occupations prepared by the International Labour Office on the basis of 45 occupational categories and a large number of defined occupations within each category. (The International Labour Office is, at the moment, revising this classification.) In other words they produce "shopping lists" on the basis of the calculations mentioned above of the total educated manpower, divided by level and main type required in the target year.

The four groups are: class A - university degree or equivalent; class B - secondary with one to three years training; class C - secondary plus technical training for one or two years; class D - completion of primary education plus practical training. Educational authorities and those responsible for manpower surveys should understand what these classifications mean as they will frequently be involved in discussions of great importance to education. In Tanzania for example[1] manpower planners believed that a primary school teacher should be in category C while the Ministry of Education maintained that the primary school teacher - for their purposes - should be in category B. The Ministry of Education - through its planning representative - should therefore be involved in this process; otherwise, economists and manpower specialists express value judgments on the educational process, which have important implications for educational targets, without the full co-operation of their colleagues in the Ministry of Education.

Maybe, a teacher in one country, at the primary level, should begin his duties as a category C person. In another country, it may not be reasonable to expect any change in the basic qualifications over the period in question,

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Skorov, G.: Integration of Education and Economic Planning in Tanzania, Paris, Unesco/IIEP, 1966. 78 p.

Mwingira, A., and Pratt, S.: The Process of Educational Planning in Tanzania, Paris, Unesco/IIEP, 1967. 102 p.

and therefore he should be in category D. In other countries it may be category B or A. In certain states of the United States and in some Scandinavian countries a primary school teacher is expected to have a university degree which involves intensive training in child psychology and so on. It may well be that, educationally, in the longer term it is essential to have some of your finest people at the primary level. This determination of the target represents a major educational policy objective. In addition to new teachers, there is a problem of gradually building up the corps of existing teachers to achieve that objective. There are all sorts of permutations by which the primary school teaching force will acquire its professional training.

Some people feel there should be a large number of classifications. On the other hand, there are arguments in favour of having four classifications which can conveniently be linked with levels of educational training. In this way, you avoid too much complexity.

SHOULD ENGINEERS HAVE A DEGREE?

Let us take another example. What proportion of a country's engineers should have a university degree? All of them? Half of them? In Greece the authorities maintained that a practising engineer should have a university degree. Two institutions were set up (at Athens and at Salonica) to train 'sub-engineers' who would teach in technical training centres. These sub-engineers were put under the academic control of the Technological Institute of the University of Athens.

A bitter dispute arose between the students and the authorities because the Technological Institute drafted a curriculum which the students believed to be too elementary. The students hoped that sub-engineers would be able to perform certain professional engineering tasks. The sub-engineers at the Salonica Institute felt that, as a result of their training, they would be able to supervise the assembly of buildings that had less than three storeys. The Technological Institute of Athens replied that these sub-engineers would not be qualified to do such work and that they were only to teach and do elementary work under the direction of skilled university engineers. This led to strike after strike. Apparently, the Technological Institute has had its way and there is still this rigorous defence of professional engineers.

In some countries, the university authorities permit part-time study and correspondence courses so that workers can train and acquire their qualifications on the job. This is another important fact when analysing education in relation to manpower needs. Are there sound arrangements to permit workers to obtain higher qualification by part-time study. In many countries this raises the question of university autonomy. Universities are proud of their

independence and where they are slow to develop part-time study, the national authorities and the educational planners may wish to discuss this question with them.

EDUCATION FOR MANAGERS

A further point with regard to class A is the question of education for managers. In a study conducted by several Mediterranean countries it was assumed that a third of all managers would have university degrees. But on what basis was that assumption made? Are we sure that a degree is of value to managers? What of countries where the university has no adequate faculty for training managers, and where study in foreign countries of management and administration makes those young men, on their return, want to become, not managers but politicians?

The qualifications which the ILO developed were made in the context of the advanced countries and have to be looked at extremely critically when it comes to their adaptation to individual developing countries. In post-secondary education, the classification may or may not correspond to reality. Training after post-secondary education may take place either in formal institutions or in firms. One of the weakest aspects of educational planning in most countries is the inadequate attention that has been given to training in factories, in the fields, to government training. So when these classifications for Grades B and C, are made it is necessary to look carefully at how the existing staff got their qualifications, and to form a view as to how the process can be developed and what educational classifications are reasonable in relation to defined jobs.

CATEGORY D

Let us now turn to primary education plus training. The educational correspondent of the French newspaper 'Le Monde', in a recent series of articles on primary and secondary education in developing countries, concluded that primary education has been expanded at the expense of producing reasonably intelligent and useful citizens. If true, this means that the bulk of those receiving primary education are not well equipped in terms of competence, industry and ability to absorb new ideas. If this argument is right, the primary system of many countries represents a partial waste of public funds and the real situation as regards 'primary plus training' differs from that assumed in some manpower projections.

One of the points made in the articles was that in the cases studied promotion from class to class bears no relationship to the performance of the children but represents a policy of acquiescence by the authorities to

parental pressures. The author argued that the standard of teaching has declined so much that in many schools the process of education has little value. Clearly, this question should be at the forefront of our approach to the planning of primary education in relation to manpower needs.

When we talk about primary education plus training as being the basis for category D, we have to ask ourselves two questions. Firstly, is the primary education of any use? Can children who leave primary school read, write and do arithmetic, do they have a knowledge of health and civics? Are they ready to receive training? Secondly, how can adequate arrangements for training be undertaken?

The classification of the employed population by educational qualification by sector and branch in the base year and target year is a vital part of manpower planning. It involves some arbitrary assumptions. If information is unavailable in a given country and the employment structure and educational qualifications structure of another (but similar in terms of economic development) country are taken as a guide there are risks that errors may result. You should therefore look critically at the ways in which the equivalence between occupation and educational qualification is worked out and be sure that the Ministry of Education is involved in this process of discussion with those undertaking manpower projections.

REACHING THE TARGET

In the target year, which in terms of education has to be 10 or 15 years from the base year, it is necessary to have a stock of qualified persons within the four categories mentioned in order to staff the economy. So the target is a stock of qualified persons, broken down, in terms of educational qualifications, into the four categories. The problem is how to move from the existing to the target situation as outlined in the perspective plan.

This is not simply a matter of comparing the existing and the target stock, because account must also be taken of the fact that some of the qualified persons at present in employment will die, some will retire, some will go to other countries and some women employees will leave employment on account of marriage. Therefore, to calculate total requirements in the period from now until the target year, it is necessary to assume how many people will leave for such reasons. The number who will die can be actuarially calculated. The number who will retire can be worked out, given details of the age composition of the labour force. So, expansion less wastage (are women who leave employment 'wasted' or not?) gives the total target for education.

There are also those receiving education and training, so to speak, in the pipe-line. They must be considered too. In some cases it may be that existing stock and output from some levels and types of education are already more than adequate in quantitative terms. The manpower education targets provide an indication of the nature of the educational effort required.

On the basis of existing plans and training arrangements it is possible to calculate how many people are going to come out of the system in the intervening period. The result of the calculations (and you can see this worked out clearly in the book by Professor Parnes[1] in pages 51 onwards) gives a differential between the total requirements on the one hand - due to expansion and the need to replace wastage - and the 'output' of existing programmes on the other hand. The differential is a figure or stock of requirements at the various levels of education and particularly the higher secondary and secondary technical levels. The problem is how to re-organize the flows in order to achieve the stock.

The build-up of enrolments is an extremely complex operation in that it is not simply a matter of finding accommodation for pupils, but also, and this is the Achilles heel of educational planning, of training teachers. To meet the target in a perspective plan requires that action be taken - phased over a period - in terms of teacher training, school buildings, finance, so that the flows of graduates in the different years during the plan cumulatively enable you to reach the stock figures in your target year. This, then, is the process involved in the manpower approach to educational planning.

## SOME OBJECTIONS DISCUSSED

Let us look, in conclusion, at some of the points which might be raised about the perspective approach to manpower targets as a guide to educational planning.

What, you may ask, is the use of a perspective plan stretching 15 years ahead unless it is backed up by measures included within five-year or seven-year plans or whatever plan may be current in the country in the intermediate period. Those who have been involved in planning will know how difficult it is to ensure that action within a five-year plan is consistent with longer-term requirements for education. It is necessary to undertake long-term policies for education because the educational process is itself a long-term operation. In the short-term, the educational system can do little to meet the needs of the economy for highly qualified persons.

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1/ OECD Forecasting Educational needs for Economic and Social Development. Paris, 1962.

For a perspective plan to be of any use in national development, there must be recognition of the need to ensure some link in practice between the long-term perspective and five-year plans, and the budget period. This is the crucial question of educational planning. If action is taken on the basis of considerations - maybe political considerations - which are outside this process, then the net result may easily be waste in terms of educational resources, in terms of unemployment of persons who have been educated because of political pressures for expansion of education but not because of any sober assessment of job opportunities.

NON-FORMAL EDUCATION NEEDED

The second point is that while the development of formal education is a long-term procedure a country has immediate requirements - not only of higher-level persons but, more urgently in many cases, of middle-level technical personnel and skilled workers. Therefore, what is required is a balance between measures to plan formal education and non-formal education respectively in relation to manpower requirements.

For instance, in Tanzania, there have been considerable and, it would seem, successful efforts to meet high-level and upper medium-level requirements. But when it comes to skilled workers and the junior level technical workers, there are gaps in the plan and difficulties in terms of action. Miss Jane King[1/], who carried out a study of non-formal education in Tanzania, noted that formal education took the lion's share of resources; there was a multiplicity of efforts involved in non-formal education; there were difficulties in finding out about the different types of non-formal education, and how they should be developed along with formal education to meet the urgent requirements of the country. So, we are once again back at the major issue of how a country can plan a massive programme of non-formal education so that the people who are working are also learning. It is hard to find any clear indication, in any of the published literature, of how a country should plan its non-formal education, how the effort should be distributed, how it should be administered, how it should be linked at the national, regional and local levels. Even if a perspective plan for formal education is a useful exercise, it takes a long time and in the meantime non-formal education must be planned. Non-formal education requires an injection of manpower from the wage and salary sector of employment and of money from the monetary sector of the economy. The question is how much non-formal education should be provided and how should it be organized?

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1/ King, J., Planning non-formal education in Tanzania. Paris, Unesco: International Institute for Educational Planning, c.1967. African research monographs No. 16.

THREE PROBLEMS OF MANPOWER FORECASTING

Then there are criticisms of the techniques of manpower forecasting which you will perhaps wish to study more deeply in your further reading.

One criticism concerns the difficulty of deriving manpower needs solely from projections of the gross domestic product. It is argued that GDP does not, in particular, indicate that in the subsistence sector of the economy there are millions of small farmers and stock raisers, who constitute the bulk of the population and for whom major efforts of improvement are required.

But perhaps if the manpower survey is adequate it does consider their needs. But to do so there must be a defined and comprehensive government policy for adequate development of non-formal education and improvement in the rural sector so that manpower planners can work out how many persons are needed for the different types of educational activities which rural development requires. Have the needs of the rural sector been neglected and manpower and educational planning because its requirements have been articulated or because they have not been articulated?

A second criticism is that the manpower approach relies heavily on the ability of the economic adviser to forecast GDP by sector and the growth of productivity and employment. It is difficult to forecast how production will be organized and hence define the needs for qualified personnel.

There will always be a degree of error in every projection. But, given the long-term nature of the response of formal education to employment needs it is perhaps better to use forecasting techniques to guide the priorities as between levels and types of educated personnel than not to use the best available forecasts. If reliance is placed solely on parental demand and ad hoc decisions it is probable that there will be greater difficulty in satisfying needs for middle level personnel or achieving a reasonable balance between higher level scientific and technical personnel and others. Nor will there be much guidance as to the desirable balance as between primary and other levels of education.

A third criticism relates to the fact that, in developing countries, the major employer of qualified personnel is the government itself and that long-term social policies, and the money to pay for them, cannot be derived with certainty from GDP projections.

The essential question is whether the long-term policy for social as well as economic development can be realised. The spending on education and other services will be determined by the wealth of the country and the

fulfilment of planned objectives. The manpower projections assume that they will be fulfilled. But it should be noted that, in contrast to the early stages of development in industrial countries of Europe where growth took place without much welfare, the characteristic of growth in the developing countries is that substantial elements of the welfare state, typical of societies where production and income per head is high, are imposed upon it. In this sense there may be a conflict between welfare objectives and economic growth, particularly where the balance of trade (and of aid) with the rest of the world is not a firm encouragement to the development process. This means that social objectives and the manpower requirements associated with them must be conceived realistically as an adjunct to economic development.

As far as this concerns education, discussion purely from the manpower standpoint does not resolve the basic issue of how much general education (and what education) and how much specialized training is desirable for each occupation. In industrialized countries the emphasis, in the early stages, was on a low level of basic education combined with an intensive system of apprenticeship which continued for a number of years. The question for developing countries is under what conditions should basic education, apprenticeship or specialization in work be continued?

To conclude, calculations of manpower requirements can be of value as a guide to educational planning so long as one does not expect this process to give complete accuracy but accepts it as a guide.

Suggested Additional Reading

UNESCO

Economic and Social Aspects of Educational Planning, Paris, Unesco, c. 1964. 264 p. Chapters 1, 2, and 3.

Parnes, H.S. Forecasting Educational Needs for Economic and Social Development. Paris, O.E.C.D., 1962. 113 p.

IIEP

Manpower Aspects of Educational Planning, Paris, Unesco/IIEP, 1967 (to be published).

African Monographs

Skorov, G. Integration of Education and Economic Planning in Tanzania, Paris, Unesco/IIEP, 1966. 78 p.

Mwingira, A., and Pratt, S. The Process of Educational Planning in Tanzania, Paris, Unesco/IIEP, 1967. 102 p.

King, J. Planning non-formal education in Tanzania, Paris, Unesco/IIEP, 1967. 40 p.